U.S. Monetary Policy
An Introduction

Q&A

U.S. monetary policy affects all kinds of economic and financial decisions people make in this country—whether to get a loan to buy a new house or car or to start up a company, whether to expand a business by investing in a new plant or equipment, and whether to put savings in a bank, in bonds, or in the stock market, for example. Furthermore, because the U.S. is the largest economy in the world, its monetary policy also has significant economic and financial effects on other countries.

The object of monetary policy is to influence the performance of the economy as reflected in such factors as inflation, economic output, and employment. It works by affecting demand across the economy—that is, people's and firms' willingness to spend on goods and services.

While most people are familiar with the fiscal policy tools that affect demand—such as taxes and government spending—many are less familiar with monetary policy and its tools. Monetary policy is conducted by the Federal Reserve System, the nation's central bank, and it influences demand mainly by raising and lowering short-term interest rates.

This booklet provides an introduction to U.S. monetary policy as it is currently conducted by answering a series of questions:

How is the Federal Reserve structured?

What are the goals of U.S. monetary policy?

What are the tools of U.S. monetary policy?

How does monetary policy affect the U.S. economy?

How does the Fed decide the appropriate setting for the policy instrument?

How is the Federal Reserve structured?

The Federal Reserve System (called the Fed, for short) is the nation's central bank. It was established by an Act of Congress in 1913 and consists of the Board of Governors in Washington, D.C., and twelve Federal Reserve District Banks (see the map; for a discussion of the Fed's overall responsibilities, see *The Federal Reserve System: Purposes and Functions*).

The Congress structured the Fed to be independent within the government—that is, although the Fed is accountable to the Congress and its goals are set by law, its conduct of monetary policy is insulated from day-to-day political pressures. This reflects the conviction that the people who control the country's money supply should be independent of the people who frame the government's spending decisions.

What makes the Fed independent?

Three structural features give the Fed independence in its conduct of monetary policy: the appointment procedure for Governors, the appointment procedure for Reserve Bank Presidents, and funding.

Appointment procedure for Governors

The seven Governors on the Federal Reserve Board are appointed by the President of the United States and confirmed by the Senate. Independence derives from a couple of factors: first, the appointments are staggered to reduce the chance that a single U.S. President could "load" the Board with appointees; second, their terms of office are 14 years—much longer than elected officials' terms.

Appointment procedure for Reserve Bank Presidents

Each Reserve Bank President is appointed to a five-year term by that Bank's Board of Directors, subject to final approval by the Board of Governors. This procedure adds to independence because the Directors of each Reserve Bank are not chosen by politicians but are selected to provide a cross-section of interests within the region, including those of depository institutions, nonfinancial businesses, labor, and the public.

Funding

The Fed is structured to be self-sufficient in the sense that it meets its operating expenses primarily from the interest earnings on its portfolio of securities. Therefore, it is independent of Congressional decisions about appropriations.

Federal Reserve Districts

1. Boston
2. New York
3. Philadelphia
4. Cleveland
5. Richmond
6. Atlanta
7. Chicago
8. St. Louis
9. Minneapolis
10. Kansas City
11. Dallas
12. San Francisco

How is the Fed "independent within the government"?

Even though the Fed is independent of Congressional appropriations and administrative control, it is ultimately accountable to Congress and comes under government audit and review. Fed officials report regularly to the Congress on monetary policy, regulatory policy, and a variety of other issues, and they meet with senior Administration officials to discuss the Federal Reserve's and the federal government's economic programs. The Fed also reports to Congress on its finances.

Who makes monetary policy?

The Fed's FOMC (Federal Open Market Committee) has primary responsibility for conducting monetary policy. The FOMC meets in Washington, D.C., eight times a year and has twelve members: the seven members of the Board of Governors, the President of the Federal Reserve Bank of New York, and four of the other Reserve Bank Presidents, who serve in rotation. The remaining Reserve Bank Presidents contribute to the Committee's discussions and deliberations.

In addition, the Directors of each Reserve Bank contribute to monetary policy by making recommendations about the appropriate discount rate, which are subject to final approval by the Governors. (See "What are the tools of U.S. monetary policy?")

What are the goals of U.S. monetary policy?

Monetary policy has two basic goals: to promote "maximum" sustainable output and employment and to promote "stable" prices. These goals are prescribed in a 1977 amendment to the Federal Reserve Act.

What do maximum sustainable output and employment mean?

In the long run, the amount of goods and services the economy produces (output) and the number of jobs it generates (employment) both depend on factors other than monetary policy. These factors include technology and people's preferences for saving, risk, and work effort. So, maximum sustainable output and employment mean the levels consistent with these factors in the long run.

But the economy goes through business cycles in which output and employment are above or below their long-run levels. Even though monetary policy can't affect either output or employment in the long run, it can affect them in the short run. For example, when demand weakens and there's a recession, the Fed can stimulate the economy—temporarily—and help push it back toward its long-run level of output by lowering interest rates. That's why stabilizing the economy—that is, smoothing out the peaks and valleys in output and employment around their long-run growth paths—is a key short-run objective for the Fed and many other central banks.

If the Fed can stimulate the economy out of a recession, why doesn't it stimulate the economy all the time?

Persistent attempts to expand the economy beyond its long-run growth path will press capacity constraints and lead to higher and higher inflation, without producing lower unemployment or higher output in the long run. In other words, not only are there no long-term gains from persistently pursuing expansionary policies, but there's also a price—higher inflation.

What's so bad about higher inflation?

High inflation is bad because it can hinder economic growth, and for a lot of reasons. For one thing, it makes it harder to tell what a change in the price of a particular product means. For example, a firm that is offered higher prices for its products can have trouble telling how much of the price change is due to stronger demand for its products and how much reflects the economy-wide rise in prices.

Moreover, when inflation is high, it also tends to vary a lot, and that makes people uncertain about what inflation will be in the future. That uncertainty can hinder economic growth in a couple of ways—it adds an inflation risk premium to long-term interest rates, and it complicates further the planning and contracting by businesses and households that are so essential to capital formation.

That's not all. Because many aspects of the tax system are not indexed to inflation, high inflation distorts economic decisions by arbitrarily increasing or decreasing after-tax rates of return to different kinds of economic activities. In addition, it leads people to spend time and resources hedging against inflation instead of pursuing more productive activities.

Another problem is that a surprise inflation tends to redistribute wealth. For example, when loans have fixed rates, a surprise inflation redistributes wealth from lenders to borrowers, because inflation lowers the real burden of making a stream of payments whose nominal value is fixed.

So should the Fed try to get the inflation rate to zero?

Actually, there's a lot of debate about that. While some economists have suggested zero inflation as a target, others argue that an inflation rate that's too low can be a problem. For example, if inflation is very low or close to zero, then short-term interest rates also are likely to be very close to zero. In that case, the Fed might not have enough room to lower short-term interest rates if it needed to stimulate the economy. Of course, the Fed could conduct policy using more unconventional methods (such as trying to reduce long-term interest rates), but it's not clear that those methods would be as easy to use or as effective. Another problem is that, when inflation is very close to zero, there's a bigger risk of deflation.

What's so bad about deflation?

First, let's talk about the difference between disinflation and deflation. Disinflation just means that the rate of inflation is slowing—say, from 3% a year to 2% a year. Deflation, in contrast, means that there's a fall in prices; and it's not just a fall in prices in some sectors—like the familiar falling prices of a lot of computer equipment. Rather, in a deflation, prices are falling throughout the economy, so the inflation rate is negative. That may sound good, if you're a consumer.

But, in fact, deflation can be as bad as too much inflation. And the reasons are pretty similar. For example, to go back to the case of the fixed-rate loan, a surprise deflation also redistributes wealth, but in the opposite direction from inflation, that is, from borrowers to lenders. The reason is that deflation raises the real burden of making a stream of payments whose nominal value is fixed.

A substantial, prolonged deflation, like the one during the Great Depression, can be associated with severe problems in the financial system. It can lead to significant declines in the value of collateral owned by households and firms, making it more difficult to borrow. And falling collateral values may force lenders to call in outstanding loans, which would force firms to cut back their scale of operations and force households to cut back consumption.

Finally, in a deflationary episode, interest rates are likely to be lower than they are during periods of low inflation, which means that the Fed's ability to stimulate the economy will be even more limited.

So that's why the other goal is "stable prices"?

Yes. Price "stability" is basically a low-inflation environment where people and firms can make financial decisions without worrying about where prices are headed. Moreover, this is all the Fed can achieve in the long run.

If low inflation is the only thing the Fed can achieve in the long run, why isn't it the sole focus of monetary policy?

Because the Fed can determine the economy's average rate of inflation, some commentators—and some members of Congress as well—have emphasized the need to define the goals of monetary policy in terms of price stability, which is achievable.

But the Fed, of course, also can affect output and employment in the short run. And big swings in output and employment are costly to people, too. So, in practice, the Fed, like most central banks, cares about both inflation and measures of the short-run performance of the economy.

Are the two goals ever in conflict?

Yes, sometimes they are. One kind of conflict involves deciding which goal should take precedence at any point in time. For example, suppose there's a recession and the Fed works to prevent employment losses from being too severe; this short-run success could turn into a long-run

problem if monetary policy remains expansionary too long, because that could trigger inflationary pressures. So it's important for the Fed to find the balance between its short-run goal of stabilization and its longer-run goal of maintaining low inflation.

Another kind of conflict involves the potential for pressure from the political arena. For example, in the day-to-day course of governing the country and making economic policy, politicians may be tempted to put the emphasis on short-run results rather than on the longer-run health of the economy. The Fed is somewhat insulated from such pressure, however, by its independence, which allows it to strive for a more appropriate balance between short-run and long-run objectives.

Why don't the goals include helping a region of the country that's in recession?

Often, some state or region is going through a recession of its own while the national economy is humming along. But the Fed can't concentrate its efforts on expanding the weak region for two reasons. First, monetary policy works through credit markets, and since credit markets are linked nationally, the Fed simply has no way to direct stimulus only to a particular part of the country that needs help. Second, if the Fed stimulated whenever any state had economic hard times, it would be stimulating much of the time, and this would result in excessive stimulation for the overall country and higher inflation.

But this focus on the well-being of the national economy doesn't mean that the Fed ignores regional economic conditions. It relies on extensive regional data and anecdotal information, along with statistics that directly measure developments in regional economies, to fit together a picture of the national economy's performance. This is one advantage to having regional Federal Reserve Bank Presidents sit on the FOMC: They're in close contact with economic developments in their regions of the country.

Why don't the goals include trying to prevent stock market "bubbles" like the one at the end of the 1990s?

In theory, stock prices should reflect the value of firms' "fundamentals," such as their expected future earnings. So it's hard to come up with logical explanations for why they would get out of line, that is, why a bubble would form. After all, U.S. stock markets are among the most efficient in the world—there's a lot of information available and the

trading mechanisms function very smoothly. And stock market analysts and others devote huge amounts of resources to figuring out what the appropriate price of a stock is at any point in time.

Even so, it's hard to deny the evidence of *mispricing* from episodes like the rise and fall of the Nasdaq over the last decade or so: it went from a monthly average of a little more than 750 in January 1995 to a peak of just over 4,800 in March 2000, before falling back to roughly 1,350 in March 2003.

Unfortunately, evidence of a bubble is easy to find after it has burst, but it's much harder to find as the bubble is forming. The reason is that policymakers—and other observers—can find it hard to tell whether stock prices are moving up because fundamentals are changing or because prices are out of line with fundamentals.

Even if the Fed *suspects* that a bubble has developed, it's not clear how monetary policy should respond. Raising the funds rate by a quarter, a half, or even a full percentage point probably wouldn't make people slow down their investments in the stock market when individual stock prices are doubling or tripling and even broad stock market indexes are going up by 20% or 30% a year. It's likely that raising the funds rate enough to burst the bubble would do significant harm to the economy. For instance, some have argued that the Fed may have worsened the Great Depression by trying to deflate the stock market bubble of the late 1920s.

Should the Fed ignore the stock market then?

Not at all. Stock markets provide information about the future course of the economy that the Fed may find useful in conducting policy. For instance, a sustained increase in the stock market is likely to make households feel wealthier, which tends to make them increase their consumption. For example, if the economy were already at full capacity, this would cause inflationary pressures. So a sustained increase in the stock market could lead the Fed to modify its inflation and output forecasts and adjust its policy response accordingly.

Beyond concerns about the economy, the Fed also pays attention to the stock market because of its concerns about financial market stability. A good example of this is what happened after the stock market crash of 1987. At that time, the Fed cut interest rates and stated that it was ready to supply the liquidity needs of the market because it wanted to ensure that markets would continue to function.

What are the tools of U.S. monetary policy?

The Fed can't control inflation or influence output and employment directly; instead, it affects them indirectly, mainly by raising or lowering a short-term interest rate called the "federal funds" rate. Most often, it does this through open market operations in the market for bank reserves, known as the federal funds market.

What are bank reserves?

Banks and other depository institutions (for convenience, we'll refer to all of these as "banks") keep a certain amount of funds in reserve to meet unexpected outflows. Banks can keep these reserves as cash in their vaults or as deposits with the Fed. In fact, banks are *required* to hold a certain amount in reserves. But, typically, they hold even more than they're required to in order to clear overnight checks, restock ATMs, and make other payments.

What is the federal funds market?

From day to day, the amount of reserves a bank wants to hold may change as its deposits and transactions change. When a bank needs additional reserves on a short-term basis, it can borrow them from other banks that happen to have more reserves than they need. These loans take place in a private financial market called the federal funds market.

The interest rate on the overnight borrowing of reserves is called the federal funds rate or simply the "funds rate." It adjusts to balance the supply of and demand for reserves. For example, if the supply of reserves in the fed funds market is greater than the demand for reserves, then the funds rate falls, and if the supply is less than the demand, then the funds rate rises.

What are open market operations?

The major tool the Fed uses to affect the supply of reserves in the banking system is open market operations—that is, the Fed buys and sells government securities on the open market. These operations are conducted by the Federal Reserve Bank of New York.

Suppose the Fed wants the funds rate to fall. To do this, it buys government securities from a bank. The Fed then pays for the securities by increasing that bank's reserves. As a result, the bank now has more reserves than it wants. So the bank can lend these unwanted reserves to

another bank in the federal funds market. Thus, the Fed's open market purchase increases the supply of reserves to the banking system, and the federal funds rate falls.

When the Fed wants the funds rate to rise, it does the reverse, that is, it sells government securities. The Fed receives payment in reserves from banks, which lowers the supply of reserves in the banking system, and the funds rate rises.

What is the discount rate?

Banks also can borrow reserves directly from the Federal Reserve Banks at their "discount windows," and the discount rate is the rate that financially sound banks must pay for this "primary credit." The Boards of Directors of the Reserve Banks set these rates, subject to the review and determination of the Federal Reserve Board. ("Secondary credit" is offered at higher interest rates and on more restrictive terms to institutions that do not qualify for primary credit.) Since January 2003, the discount rate has been set 100 basis points above the funds rate target, though the difference between the two rates could vary in principle. Setting the discount rate higher than the funds rate is designed to keep banks from turning to this source before they have exhausted other less expensive alternatives. At the same time, the (relatively) easy availability of reserves at this rate effectively places a ceiling on the funds rate.

What about foreign currency operations?

Purchases and sales of foreign currency by the Fed are directed by the FOMC, acting in cooperation with the Treasury, which has overall responsibility for these operations. The Fed does not have targets, or desired levels, for the exchange rate. Instead, the Fed gets involved to counter disorderly movements in foreign exchange markets, such as speculative movements that may disrupt the efficient functioning of these markets or of financial markets in general. For example, during some periods of disorderly declines in the dollar, the Fed has purchased dollars (sold foreign currency) to absorb some of the selling pressure.

Intervention operations involving dollars, whether initiated by the Fed, the Treasury, or by a foreign authority, are not allowed to alter the supply of bank reserves or the funds rate. The process of keeping intervention from affecting reserves and the funds rate is called the "sterilization" of exchange market operations. As such, these operations are not used as a tool of monetary policy.

How does monetary policy affect the U.S. economy?

The point of implementing policy through raising or lowering interest rates is to affect people's and firms' demand for goods and services. This section discusses how policy actions affect real interest rates, which in turn affect demand and ultimately output, employment, and inflation.

What are real interest rates and why do they matter?

For the most part, the demand for goods and services is not related to the market interest rates quoted in the financial pages of newspapers, known as nominal rates. Instead, it is related to *real* interest rates—that is, nominal interest rates minus the expected rate of inflation.

For example, a borrower is likely to feel a lot happier about a car loan at 8% when the inflation rate is close to 10% (as it was in the late 1970s) than when the inflation rate is close to 2% (as it was in the late 1990s). In the first case, the real (or inflation-adjusted) value of the money that the borrower would pay back would actually be lower than the real value of the money when it was borrowed. Borrowers, of course, would love this situation, while lenders would be disinclined to make any loans.

So why doesn't the Fed just set the real interest rate on loans?

Remember, the Fed operates only in the market for bank reserves. Because it is the sole supplier of reserves, it can set the nominal funds rate. The Fed can't set real interest rates directly because it can't set inflation expectations directly, even though expected inflation is closely tied to what the Fed is expected to do in the future. Also, in general, the Fed has stayed out of the business of setting nominal rates for longer-term instruments and instead allows financial markets to determine longer-term interest rates.

How can the Fed influence long-term rates then?

Long-term interest rates reflect, in part, what people in financial markets expect the Fed to do in the future. For instance, if they think the Fed isn't focused on containing inflation, they'll be concerned that inflation might move up over the next few years. So they'll add a risk premium to long-term rates, which will make them higher. In other words, the markets' expectations about monetary policy tomorrow have a substantial impact on long-term interest rates today. Researchers have pointed out that the Fed could inform markets about future values of the funds rate in a

number of ways. For example, the Fed could follow a policy of moving gradually once it starts changing interest rates. Or, the Fed could issue statements about what kinds of developments the FOMC is likely to focus on in the foreseeable future; the Fed even could make more explicit statements about the future stance of policy.

How do these policy-induced changes in real interest rates affect the economy?

Changes in real interest rates affect the public's demand for goods and services mainly by altering borrowing costs, the availability of bank loans, the wealth of households, and foreign exchange rates.

For example, a decrease in real interest rates lowers the cost of borrowing; that leads businesses to increase investment spending, and it leads households to buy durable goods, such as autos and new homes.

In addition, lower real rates and a healthy economy may increase banks' willingness to lend to businesses and households. This may increase spending, especially by smaller borrowers who have few sources of credit other than banks.

Lower real rates also make common stocks and other such investments more attractive than bonds and other debt instruments; as a result, common stock prices tend to rise. Households with stocks in their portfolios find that the value of their holdings is higher, and this increase in wealth makes them willing to spend more. Higher stock prices also make it more attractive for businesses to invest in plant and equipment by issuing stock.

In the short run, lower real interest rates in the U.S. also tend to reduce the foreign exchange value of the dollar, which lowers the prices of the U.S.-produced goods we sell abroad and raises the prices we pay for foreign-produced goods. This leads to higher aggregate spending on goods and services produced in the U.S.

The increase in aggregate demand for the economy's output through these different channels leads firms to raise production and employment, which in turn increases business spending on capital goods even further by making greater demands on existing factory capacity. It also boosts consumption further because of the income gains that result from the higher level of economic output.

How does monetary policy affect inflation?

Wages and prices will begin to rise at faster rates if monetary policy stimulates aggregate demand enough to push labor and capital markets beyond their long-run capacities. In fact, a monetary policy that persistently attempts to keep short-term real rates low will lead eventually to higher inflation and higher nominal interest rates, with no permanent increases in the growth of output or decreases in unemployment. As noted earlier, in the long run, output and employment cannot be set by monetary policy. In other words, while there is a trade-off between higher inflation and lower unemployment in the short run, the trade-off disappears in the long run.

Policy also affects inflation directly through people's expectations about future inflation. For example, suppose the Fed eases monetary policy. If consumers and businesspeople figure that will mean higher inflation in the future, they'll ask for bigger increases in wages and prices. That in itself will raise inflation without big changes in employment and output.

Doesn't U.S. inflation depend on worldwide capacity, not just U.S. capacity?

In this era of intense global competition, it might seem parochial to focus on U.S. capacity as a determinant of U.S. inflation, rather than on world capacity. For example, some argue that even if unemployment in the U.S. drops to very low levels, U.S. workers wouldn't be able to push for higher wages because they're competing for jobs with workers abroad, who are willing to accept much lower wages. The implication is that inflation is unlikely to rise even if the Fed adopts an easier monetary policy.

This reasoning doesn't hold up too well, however, for a couple of reasons. First, a large proportion of what we consume in the U.S. isn't affected very much by foreign trade. One example is health care, which isn't traded internationally and which amounts to nearly 15% of U.S. GDP.

More important, perhaps, is the fact that such arguments ignore the role of flexible exchange rates. If the Fed were to adopt an easier policy, it would tend to increase the supply of U.S. dollars in the market. Ultimately, this would tend to drive down the value of the dollar relative to other countries, as U.S. consumers and firms used some of this increased money supply to buy foreign goods and foreigners got rid of the additional U.S. currency they did not want. Thus, the price of foreign goods in terms of U.S. dollars would go up—even though they would

not in terms of the foreign currency. The higher prices of imported goods would, in turn, tend to raise the prices of U.S. goods.

How long does it take a policy action to affect the economy and inflation?

It can take a fairly long time for a monetary policy action to affect the economy and inflation. And the lags can vary a lot, too. For example, the major effects on output can take anywhere from three months to two years. And the effects on inflation tend to involve even longer lags, perhaps one to three years, or more.

Why are the lags so hard to predict?

So far, we've described a complex chain of events that links a change in the funds rate with subsequent changes in output and inflation. Developments anywhere along this chain can alter how much a policy action will affect the economy and when.

For example, one link in the chain is long-term interest rates, and they can respond differently to a policy action, depending on the market's expectations about future Fed policy. If markets expect a change in the funds rate to be the beginning of a series of moves in the same direction, they'll factor in those future changes right away, and long-term rates will react by more than if markets had expected the Fed to take no further action. In contrast, if markets had anticipated the policy action, long-term rates may not move much at all because they would have factored it into the rates already. As a result, the same policy move can appear to have different effects on financial markets and, through them, on output and inflation.

Similarly, the effect of a policy action on the economy also depends on what people and firms outside the financial sector think the Fed action means for inflation in the future. If people believe that a tightening of policy means the Fed is determined to keep inflation under control, they'll immediately expect low inflation in the future, so they're likely to ask for smaller wage and price increases, and this will help achieve low inflation. But if people aren't convinced that the Fed is going to contain inflation, they're likely to ask for bigger wage and price increases, and that means that inflation is likely to rise. In this case, the only way to bring inflation down is to tighten so much and for so long that there are significant losses in employment and output.

What problems do lags cause?

The Fed's job would be much easier if monetary policy had swift and sure effects. Policymakers could set policy, see its effects, and then adjust the settings until they eliminated any discrepancy between economic developments and the goals.

But with the long lags associated with monetary policy actions, the Fed must try to anticipate the effects of its policy actions into the distant future. To see why, suppose the Fed waits to shift its policy stance until it actually sees an increase in inflation. That would mean that inflationary momentum already had developed, so the task of reducing inflation would be that much harder and more costly in terms of job losses. Not surprisingly, anticipating policy effects in the future is a difficult task.

How does the Fed decide the appropriate setting for the policy instrument?

The Fed's job of stabilizing output in the short run and promoting price stability in the long run involves several steps. First, the Fed tries to estimate how the economy is doing now and how it's likely to do in the near term—say, over the next couple of years or so. Then it compares these estimates to its goals for the economy and inflation. If there's a gap between the estimates and the goals, the Fed then has to decide how forcefully and how swiftly to act to close that gap. Of course, the lags in policy complicate this process. But so do a host of other things.

What things complicate the process of determining how the economy is doing?

Even the most up-to-date data on key variables like employment, growth, productivity, and so on, reflect conditions in the past, not conditions today; that's why the process of monetary policymaking has been compared to driving while looking only in the rearview mirror. So, to get a reasonable estimate of current and near-term economic conditions, the Fed first tries to figure out what the most relevant economic developments are; these might be things like the government's taxing and spending policies, economic developments abroad, financial conditions at home and abroad, and the use of new technologies that boost productivity. These developments can then be incorporated into an economic model to see how the economy is likely to evolve over time.

Sounds easy—plug the numbers into the model and get an answer. So what's the problem?

There are lots of problems. One problem is that models are only approximations—they can't capture the full complexity of the economy. Another problem is that, so far, no single model adequately explains the entire economy—at least, you can't get economists to agree on a single model; and no single model outperforms others in predicting future developments in every situation. Another problem is that the forecast can be off base because of unexpected, even unprecedented, developments—the September 11 attacks are a case in point. So in practice, the Fed tries to deal with this uncertainty by using a variety of models and indicators, as well as informal methods, to construct a picture of the economy. These informal methods can include anecdotes and other information collected from all kinds of sources, such as the Directors of the Federal Reserve Banks, the Fed's various advisory bodies, and the press.

So now are we in a position to compare the Fed's estimates with its goals?

Not so fast. Coming up with operational measures of the goals is harder than you might think, especially the goal for the rate of maximum sustainable output growth. Unfortunately, this is not something you can go out and measure. So, once again, the Fed has to turn to some sort of model or indicator to estimate it. And it's hard to be certain about any estimate, in part because it's hard to be certain that the model or indicator the estimate is based on is the right one. There's one more important complication in estimating the rate of maximum sustainable growth—it can shift over time!

What problems does a shift in the rate of maximum sustainable growth cause?

The experience of the late 1990s provides a good example of the policy problems caused by such a shift. During this period, output and productivity surged at the same time that rapid innovation was transforming the information technology industry. In the early stages, there was no way for the Fed—or anybody else—to tell why output was growing so fast. In other words, the Fed had to determine how much of the surge in output was due to unusually rapid technical progress and whether this implied an increase in the economy's trend growth rate.

This was a crucial issue because policy would respond differently depending on exactly why the economy was growing faster. If it was largely due to the spread of new technologies that enhanced worker and capital productivity, implying that the trend growth rate was higher, then the economy could expand faster without creating inflationary pressures. In that case, monetary policy could stand pat. But if it was just the economy experiencing a more normal business cycle expansion, then inflation could heat up. In that case, monetary policy would need to tighten up.

The Fed's job was complicated by the fact that statistical models did not find sufficient evidence to suggest a change in the trend growth rate. But the Fed looked at a variety of indicators, such as the profit data from firms, as well as at informal evidence, such as anecdotes, to conclude that the majority of the evidence was consistent with an increase in the trend growth rate. On that basis, the Fed refrained from tightening policy as much as it would have otherwise.

Does the trend growth rate ever fall?

Yes, it does. A good example, with a pretty bad outcome, was what happened in the early 1970s, a period marked by a significant *slowdown*

in the trend growth rate. A number of economists have argued that the difficulty in determining that such a slowdown had actually taken place caused the Fed to adopt an easier monetary policy than it might otherwise have, which in turn contributed to the substantial acceleration in inflation observed later in the decade.

What happens when the estimates for growth and inflation are different from the Fed's goals?

Let's take the case where the forecast is that growth will be below the goal. That would suggest a need to ease policy. But that's not all. The Fed also must decide two other things: (1) how strongly to respond to this deviation from the goal and (2) how quickly to try to eliminate the gap. Once again, it can use its models to try to determine the effects of various policy actions. And, once again, the Fed must deal with the problems associated with uncertainty as well as with the measurement problems we have already discussed.

Uncertainty seems to be a problem at every stage. How does the Fed deal with it?

Uncertainty does, indeed, pervade every part of the monetary policy-making process. There is as yet no set of policies and procedures that policymakers can use to deal with all the situations that may arise. Instead, policymakers must decide how to proceed by going case by case.

For instance, when policymakers are more uncertain about their reading of the current state of the economy, they may react more gradually to economic developments than they would otherwise. And because it's hard to come up with unambiguous benchmarks for the economy's performance, the Fed may look at more than one kind of benchmark. For instance, because it's hard to get a precise estimate of the trend growth rate of output, the Fed may look at the labor market to try to figure out where the unemployment rate is relative to some kind of benchmark or "natural rate," that is, the rate that would be consistent with price stability. Alternatively, it might try to determine whether the stance of policy is appropriate by comparing the real funds rate to an estimate of the "equilibrium interest rate," which can be defined as the real rate that would be consistent with maximum sustainable output in the long run.

These issues are far from settled. Indeed the Fed spends a great deal of time and effort in researching various ways to deal with different kinds of uncertainty and in trying to figure out what kind of model or indicator is likely to perform best in a given situation. Since these issues aren't likely to be resolved anytime soon, the Fed is likely to continue to look at everything.

Suggested Reading

For an overview of the Federal Reserve System and its functions, see:

The Federal Reserve System: Purposes and Functions, 8th ed. Washington, DC: Board of Governors, Federal Reserve System, December 1994.

The Federal Reserve System in Brief. Federal Reserve Bank of San Francisco.

For further discussion on several of the topics in this booklet, see the following issues of the Federal Reserve Bank of San Francisco's *FRBSF Economic Letter:*

Overview of Monetary Policy

94-27 "A Primer on Monetary Policy, Part I: Goals and Instruments," by Carl Walsh.

Goals of Monetary Policy

2003-34 "Should the Fed React to the Stock Market?" by Kevin Lansing.

2001-03 "Inflation: The 2% Solution," by Milton Marquis.

2000-24 "Should Central Banks Stabilize Prices?" by Carl Walsh.

99-04 "The Goals of U.S. Monetary Policy," by John Judd and Glenn Rudebusch.

98-18 "U.S. Inflation Targeting: Pro and Con," by Glenn Rudebusch and Carl Walsh.

98-17 "Central Bank Inflation Targeting," by Glenn Rudebusch and Carl Walsh.

98-04 "The New Output-Inflation Trade-off," by Carl Walsh.

97-27 "What Is the Optimal Rate of Inflation?" by Timothy Cogley.

97-01 "Nobel Views on Inflation and Unemployment," by Carl Walsh.

95-16 "Central Bank Independence and Inflation," by Robert T. Parry.

94-25 "Should the Central Bank Be Responsible for Regional Stabilization?" by Timothy Cogley and Desiree Schaan.

94-05 "Is There a Cost to Having an Independent Central Bank?" by Carl Walsh.

93-44 "Inflation and Growth," by Brian Motley.

93-21 "Federal Reserve Independence and the Accord of 1951," by Carl Walsh.

Monetary Policy Tools and the Transmission Mechanism

2002-30 "Setting the Interest Rate," by Milton Marquis.

97-18 "Interest Rates and Monetary Policy," by Glenn Rudebusch.

95-23 "Federal Reserve Policy and the Predictability of Interest Rates," by Glenn Rudebusch.

95-05 "What Are the Lags in Monetary Policy?" by Glenn Rudebusch.

The Conduct of Monetary Policy

2004-05 "Precautionary Policies," by Carl Walsh.

2003-32 "The Natural Rate of Interest," by John Williams.

2003-15 "What Makes the Yield Curve Move?" by Tao Wu.

2003-14 "Minding the Speed Limit," by Carl Walsh.

2001-26 "Transparency in Monetary Policy," by Carl Walsh.

2001-13 "The Science (and Art) of Monetary Policy," by Carl Walsh.

2001-05 "How Sluggish Is the Fed?" by Glenn Rudebusch.

2000-31 "Monetary Policy in a New Environment: The U.S. Experience," by Robert T. Parry.

2000-21 "Exploring the Causes of the Great Inflation," by Kevin Lansing.

99-33 "Risks in the Economic Outlook," by Robert T. Parry.

99-21 "Supply Shocks and the Conduct of Monetary Policy," by Bharat Trehan.

98-38 "Describing Fed Behavior," by John Judd and Glenn Rudebusch.

98-28 "The Natural Rate, NAIRU, and Monetary Policy," by Carl Walsh.

97-35 "NAIRU: Is It Useful for Monetary Policy?" by John Judd.

97-29 "A New Paradigm?" by Bharat Trehan.

94-13 "Monetary Policy in a Low-Inflation Regime," by Timothy Cogley.

93-42 "Monetary Policy and Long-Term Real Interest Rates," by Timothy Cogley.

93-38 "Real Interest Rates," by Bharat Trehan.

93-01 "An Alternative Strategy for Monetary Policy," by Brian Motley and John Judd.

Where to get copies of publications and articles in "Suggested Reading"

Links to these articles are in the online version of this pamphlet:
www.frbsf.org/publications/federalreserve/monetary/reading.html

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Glossary of Terms

Capital market. The market in which corporate equity and longer-term debt securities (those maturing in more than one year) are issued and traded.

Central bank. Principal monetary authority of a nation, which performs several key functions, including issuing currency and regulating the supply of money and credit in the economy. The Federal Reserve is the central bank of the United States.

Depository institution. Financial institution that obtains its funds mainly through deposits from the public; includes commercial banks, savings and loan associations, savings banks, and credit unions.

Discount rate. Interest rate at which an eligible depository institution may borrow funds, typically for a short period, directly from a Federal Reserve Bank. The law requires that the Board of Directors of each Reserve Bank establish the discount rate every fourteen days subject to the approval of the Board of Governors.

Excess reserves. Amount of reserves held by an institution in excess of its reserve requirement and required clearing balance.

Federal funds rate. The interest rate at which banks borrow surplus reserves and other immediately available funds. The federal funds rate is the shortest short-term interest rate, with maturities on federal funds concentrated in overnight or one-day transactions.

Fiscal policy. Federal government policy regarding taxation and spending, set by Congress and the Administration.

Foreign currency operations. Purchase or sale of the currencies of other nations by a central bank for the purpose of influencing foreign exchange rates or maintaining orderly foreign exchange markets. Also called foreign exchange market intervention.

Foreign exchange rate. Price of the currency of one nation in terms of the currency of another nation.

Government securities. Securities issued by the U.S. Treasury or federal agencies.

Gross domestic product (GDP). The total market value of a nation's final output of goods and services. GDP may be expressed in terms of product—consumption, investment, government purchases of goods and services, and net exports—or, it may be expressed in terms of income earned—wages, interest, and profits.

Inflation. The rate of increase of the general price level of all goods and services. (This should not be confused with increases in the prices of specific goods relative to the prices of other goods.)

Inflationary expectations. The rate of increase in the general price level anticipated by the public in the period ahead.

Long-term interest rates. Interest rates on loan contracts—or debt instruments such as Treasury bonds or utility, industrial, or municipal bonds—having maturities greater than one year. Often called capital market rates.

M1. Measure of the U.S. money stock that consists of (1) currency outside the U.S. Treasury, Federal Reserve Banks, and the vaults of depository institutions; (2) travelers checks of nonbank issuers; (3) demand deposits at all commercial banks other than those due to depository institutions, the U.S. government, and foreign banks and official institutions, less cash items in the process of collection and Federal Reserve float; and (4) other checkable deposits (OCDs), consisting of negotiable order of withdrawal (NOW) and automatic transfer service (ATS) accounts at depository institutions, credit union share draft accounts, and demand deposits at thrift institutions.

M2. Measure of the U.S. money stock that consists of M1 plus savings deposits (including money market deposit accounts), small-denomination time deposits (time deposits—including retail RPs—in amounts of less than $100,000), and balances in retail money market mutual funds. Excludes individual retirement account (IRA) and Keogh balances at depository institutions and money market funds.

M3. Measure of the U.S. money stock that consists of M2 plus large-denomination time deposits (in amounts of $100,000 or more), balances in institutional money funds, RP liabilities (overnight and term) issued by all depository institutions, and Eurodollars (overnight and term) held by U.S. residents at foreign branches of U.S. banks worldwide and at all banking offices in the United Kingdom and Canada. Excludes amounts held by depository institutions, the U.S. government, money funds, and foreign banks and official institutions.

Market interest rates. Rates of interest paid on deposits and other investments, determined by the interaction of the supply of and demand for funds in financial markets.

Monetary policy. A central bank's actions to influence short-term interest rates and the supply of money and credit, as a means of helping to promote national economic goals. Tools of U.S. monetary policy include open market operations, discount rate policy, and reserve requirements.

Nominal interest rates. Stated rates of interest paid or earned; often thought of as consisting of a real rate of interest and a premium to compensate for expected inflation.

Open market operations. Purchases and sales of government and certain other securities in the open market, through the Domestic Trading Desk at the Federal Reserve Bank of New York as directed by the Federal Open Market Committee. Open market operations influence short-term interest rates and the volume of money and credit in the economy. Purchases inject reserves into the banking system and stimulate growth of money and credit; sales do the opposite.

Productivity. The amount of output per hour of work.

Real GDP. The value of GDP in constant (that is, inflation-adjusted) dollars, which is used as a measure of the nation's final output.

Real interest rates. Interest rates adjusted for the expected erosion of purchasing power resulting from inflation. Technically defined as nominal interest rates minus the expected rate of inflation.

Short-term interest rates. Interest rates on loan contracts—or debt instruments such as Treasury bills, bank certificates of deposit, or commercial paper—having maturities less than one year. Often called money market rates.

Total nonfinancial debt. Includes outstanding credit market debt of federal, state, and local governments and of private nonfinancial sectors (including mortgages and other kinds of consumer credit and bank loans, corporate bonds, commercial paper, bankers acceptances, and other debt instruments).